Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of error compensation for measurements taken using a ~~co-ordinate~~ coordinate positioning apparatus comprising an articulating probe head having a surface detecting device, wherein the surface detecting device is rotated about at least one axis of the articulating probe head during ~~measurement,~~ the measurements, the method comprising the following steps in any suitable order:

(a) determining ~~the stiffness~~ a stiffness of ~~the whole~~ a whole or ~~part~~ a part of the coordinate positioning apparatus;

(b) determining ~~the load~~ a load or one or more factors which relate to the load applied by ~~the~~ a motion of the articulating probe head about said at least one axis at any particular instant; and

(c) determining ~~the measurement~~ a measurement error at the surface ~~sensing~~ detecting device caused by the load, using ~~the data from~~ data determined in steps (a) and (b).

2. (Original) A method according to claim 1 wherein the load comprises a torque.

3. (Previously Presented) A method according to claim 1 wherein the load comprises a linear force.

4. (Currently Amended) A method according to claim 1 wherein the surface ~~sensing~~ detecting device is a contact probe.

5. (Currently Amended) A method according to claim 1 wherein the surface ~~sensing~~ detecting device is a non-contact probe.

6. (Currently Amended) A method according to claim 1 wherein the stiffness is determined in step (a) by applying a load to the whole or part of the coordinate positioning apparatus and measuring ~~the deflection.~~ a deflection.

7. (Currently Amended) A method according to claim 1 wherein the stiffness is determined in step (a) by:

measuring an object of known dimensions to obtain measured dimensions whilst measuring the load applied to the whole or part of the coordinate positioning apparatus;

wherein ~~the deflection~~ a deflection of the whole or part of the apparatus is determined ~~from the~~ based on a difference between the known and measured dimensions of the object; and

wherein the stiffness is derived from the load and the deflection.

8. (Currently Amended) A method according to claim 7 wherein the known dimensions of the object are determined by measuring ~~it at~~ the object at a slow speed.

9. (Currently Amended) A method according to claim 1 wherein the surface ~~sensing~~ detecting device is a contact probe having a workpiece contacting stylus, and wherein the stiffness is determined in step (a) by:

positioning the contact probe so that the workpiece contacting stylus is in contact with ~~the surface~~ a surface of an object of known dimensions;

taking measurement readings of the surface when different probe forces are applied;

wherein ~~the deflection~~ a deflection of the whole or part of the coordinate positioning apparatus is determined ~~from the~~ based on a difference between the known dimensions and ~~measured dimensions;~~ the measurement readings; and

wherein the stiffness is derived from ~~the applied force~~ the probe forces and the deflection.

10. (Currently Amended) A method according to claim 1 wherein the surface ~~sensing~~ detecting device is a contact probe having a workpiece contacting stylus, and wherein the stiffness is determined in step (a) by:

positioning the contact probe so that the workpiece contacting stylus is in contact with ~~the surface~~ a surface of an object of known dimensions;

oscillating the articulating probe head as ~~the probe~~ a probe tip of the articulating probe head remains in contact with the surface;

taking measurement ~~reading~~ readings of the surface when oscillating at different probe frequencies and hence accelerations;

wherein ~~the deflection~~ a deflection of the whole or part of the coordinate positioning apparatus is determined ~~from the~~ based on a difference between the known dimensions and the ~~measured dimensions;~~ measurement readings; and

wherein the stiffness is derived from the ~~acceleration~~ accelerations and ~~deflection.~~ the deflection.

11. (Currently Amended) A method according to claim 1 wherein the one or more factors which relate to the load in step (b) is determined ~~from~~ based on system variables of the coordinate positioning apparatus.

12. (Currently Amended) A method according to claim 11 wherein the one or more factors which relate to the load in step (b) is determined ~~from the~~ based on current applied to at least one motor in the articulating probe head.

13. (Currently Amended) A method according to claim 11 wherein the one or more factors which relate to the load in step (b) is determined by double differentiation of ~~the measurement~~ measurement data from ~~the position~~ a position measuring device in the articulating probe head.

14. (Currently Amended) A method according to claim 1 wherein the one or more factors which relate to the load in step (b) is determined using a torque meter or accelerometer.

15. (Currently Amended) A method according to claim 1, the method ~~including~~ further comprising ~~the step of~~ determining ~~the offset~~ an offset of ~~the measurement~~ a measurement path of the surface ~~sensing~~ detecting device from a datum point, and wherein ~~this~~ the offset is used in calculating the measurement error.

16. (Currently Amended) A method according to claim 15, wherein the measurement error determined in step (c) is substantially proportional to $(L\cos\varphi)\delta\theta$, wherein L is ~~the distance~~ a distance from ~~a datum point~~ the datum point, the datum point being in the articulating probe ~~head~~ head, to the measurement path of the surface ~~sensing~~ detecting device, φ is ~~the angle~~ an angle between the surface ~~sensing~~ detecting device and an axis normal to ~~the axis~~ an axis of a structure onto which the articulating probe head is mounted and $\delta\theta$ is ~~the~~

~~angular~~ an angular deflection of the ~~mount.~~ structure onto which the articulating probe head is mounted.

17. (Currently Amended) A method according to claim 16, wherein the ~~probe~~ surface detecting device is a contact probe and L is the distance between ~~the tip~~ a tip of the surface ~~sensing~~ detecting device and ~~the centre~~ a center of rotation.

18. (Currently Amended) ~~Co-ordinate~~A coordinate positioning apparatus comprising an articulating probe head having a surface detecting device, wherein the surface detecting device is rotatable about at least one axis of the articulating probe head, ~~the stiffness~~ a stiffness of ~~the whole~~ a whole or ~~part~~ a part of the coordinate positioning apparatus being known;

the coordinate positioning apparatus being provided with means to determine one or more factors which relate to ~~the load~~ a load applied by a motion of the articulating probe head about said at least one axis at any particular instant;

and wherein the ~~co-ordinate~~ coordinate positioning apparatus includes a processor ~~adapted~~ configured to determine ~~the measurement~~ a measurement error at the surface ~~sensing~~ detecting device caused by the load, using the known stiffness of the whole or part of the coordinate positioning apparatus and the determined one or more factors relating to the load.